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$$\text{Ar}^1 - \text{N} - \text{Ar}^2 - \text{CH} = \text{CH} - \text{CH} = \text{CH} - \text{C} - \text{Ar}^3 - \text{N} \begin{matrix} | \\ \text{R}^4 \end{matrix} \begin{matrix} \text{R}^5 \\ \text{R}^6 \end{matrix}$$

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[Translation done.]

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

[Detailed Description of the Invention]

 $[0001]$

[Industrial Application] This invention relates to the photo conductor for electrophotography which made the detailed compound of specification [the inside of a sensitization layer] contain about the photo conductor for electrophotography.

[0002]

[Description of the Prior Art] Conventionally, mineral matter, such as a selenium, a cadmium sulfide, and a zinc oxide, is one of those which are used as a photoconductivity material of the photoconductor used in an electrophotography method. It is one of the image-formation methods which the "electrophotography method" said here is a dark place first, for example, makes it the photoconductor of a photoconductivity charged by corona discharge, it subsequently carries out image exposure, it carries out the fly off of the charge of only the exposure section alternatively, acquires an electrostatic latent image, generally develops and visualizes this latent-image section by the **** particle (toner) which consists of coloring matters, such as a color and a pigment, and binders, such as a high polymer, and formed the image.

[0003] As a fundamental property required of a photo conductor in such a xerography, that it can be charged in suitable potential in (1) dark place, that there is little fly off of a charge in (2) dark places, carrying out the fly off of the charge and dealing in it promptly, by (3) light exposure, etc. are raised.

[0004] By the way, the actual condition is that the aforementioned mineral matter also has various defects while each has many advantages. for example, current -- although the selenium used widely fully satisfies the conditions of aforementioned (1) - (3), the conditions to manufacture are difficult and it is difficult for a manufacturing cost to become high, and for there to be no flexibility, and to process it in the shape of a belt, and since it is sharp against the impact of heat or a machine target, there is also a defect, like handling takes cautions. Although the resin as a binder is distributed and it is used as a photo conductor, neither a cadmium sulfide nor a zinc oxide can be repeatedly used, if it remains as it is, since there are mechanical defects, such as smooth nature, a degree of hardness, tensile strength, and abrasion resistance.

[0005] In order to eliminate the defect of these mineral matter in recent years, the photo conductor for electrophotography using various organic substances is proposed, and there are some with which practical use is presented. For example, the photo conductor which consists of Polly N-vinylcarbazole and 2, 4, and 7-trinitro fluorene-9-ON (it indicates on U.S. Pat. No. 3484237 specifications), The photo conductor which comes to carry out sensitization of the Polly N-vinylcarbazole with pyrylium salt system coloring matter (it indicates to JP,48-25658,B), The photo conductor which uses an organic pigment as a principal component (it indicates to JP,47-37543,A), The photo conductor which uses as a principal component the eutectic complex which consists of a color and resin (it indicates to JP,47-10735,A), The photo conductor which comes to carry out coloring matter sensitization of the triphenylamine compound (U.S. Pat. No. 3,180,730), The photo conductor using an amine derivative as a charge transportation material (JP,57-195254,A), The photo conductor using Polly N-vinylcarbazole and an amine derivative as a charge transportation material (JP,58-1155,A), It is the photo conductor (U.S. Pat. No. 3,265,496, JP,39-11546,B, JP,53-27033,A) which uses a benzidine compound as a photoconduction material also in the polyfunctional 3rd amine compound. Although these photo conductors have the outstanding property and it is thought also with it being practical that it is worthy, when various demands to a photo conductor are taken into consideration, in a xerography, the actual condition is that what fully satisfies these demands is not obtained yet.

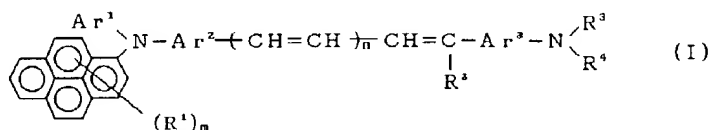
[0006]

[Problem(s) to be Solved by the Invention] The purpose of this invention cancels the various defects which the conventional photo conductor described previously has, and is to offer the photo conductor with which it may be satisfied of the conditions demanded in a xerography enough. Furthermore, manufacture can perform other purposes of this invention comparatively easily cheaply, and is to offer the photo conductor for electrophotography excellent also in endurance.

[0007]

[Means for Solving the Problem] According to this invention, a photo conductor for electrophotography characterized by having a sensitization layer which contains at least one sort of an olefin compound which has a pyrenyl radical expressed with the following general formula (I) and (** 1) on a conductive base material as an active principle is offered.

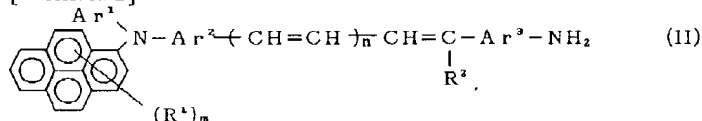
[Formula 1]



(R1, *****, a low-grade alkyl group, or an alkoxy group is expressed.) R2 expresses the phenyl group which is not replaced [the alkyl group which is not replaced / a hydrogen atom, a cyano group, an alkoxy carbonyl group, substitute, or /, substitute, or]. R3, R4, and Ar1 express the ring type aromatic series radical which is not replaced [the alkyl group which is not replaced / substitute or /, substitute, or]. Ar2 and Ar3 express the divalent radical of the ring type aromatic series which is not replaced [substitute or]. Even if R3, R4, Ar1, Ar2, and Ar3 are the same respectively, they may differ. In m, 1-3n express the integer of 0 or 1.

[0008] The olefin compound which has the pyrenyl radical expressed with said general formula (I) which a sensitization layer is made to contain in this invention, and (** 1) is a general formula (II) (** 2).

[Formula 2]



(-- R1, R2, Ar1, Ar2, Ar3, and m and n are the same as that of the aforementioned definition among a formula.) -- the diamine compound and the following general formula (III) (** 3) which have the pyrenyl radical expressed

[Formula 3]



(R3 expresses among a formula the ring type aromatic series radical which is not replaced [the alkyl group which is not replaced / substitute or /, substitute, or], and X expresses a halogen atom.)

And the following general formula (IV) (** 4)

[Formula 4]



(-- R4 expresses among a formula the ring type aromatic series radical which is not replaced [the alkyl group which is not replaced / substitute or /, substitute, or], and X expresses a halogen atom.) -- it is manufactured by making the halogenated compound expressed react.

[0009] Next, the olefin compound which has the pyrenyl radical of said general formula (I) and (** 1) is explained in more detail. It can set to a general formula (I) and (** 1), and the following can be mentioned as those substituents as an example of R1-R4, and Ar1, Ar2, Ar3 and X.

[0010] (1) Halogen atom; a fluorine, chlorine, a bromine, and iodine are mentioned.

(2) Alkyl group; preferably, it is the alkyl group of the straight chain of C1-C4, or branched chain still more preferably, and these alkyl groups are a fluorine atom, a hydroxyl group, a cyano group, the alkoxy group of C1-C4, a phenyl group or a halogen atom, the alkyl group of C1-C4, or an alkoxy group of C1-C4 further, and may contain C1 - the C12 division C1-C9, and the replaced phenyl group. Specifically, a methyl group, an ethyl group, n-propyl group, i-propyl group, t-butyl, s-butyl, n-butyl, i-butyl, a trifluoromethyl radical, 2-hydroxyethyl radical, 2-cyano ethyl group, 2-ethoxyethyl radical, 2-methoxy ethyl group, benzyl, 4-chloro benzyl, 4-methylbenzyl radical, 4-methoxybenzyl radical, 4-phenyl benzyl, etc. are mentioned.

(3) Alkoxy group (-OR5); R5 expresses the alkyl group which (2) defined. Specifically, a methoxy group, an ethoxy radical, n-propoxy group, i-propoxy group, a t-butoxy radical, an n-butoxy radical, an s-butoxy radical, an i-butoxy radical, a 2-hydroxy ethoxy radical, 2-cyanoethoxy radical, a benzyloxy radical, 4-methylbenzyl oxy-radical, a trifluoro methoxy group, etc. are mentioned.

(4) Aryloxy group; a phenyl group and a naphthyl group are raised as an aryl group. This may contain the alkoxy group of C1-C4, the alkyl group of C1-C4, or a halogen atom as a substituent. Specifically, a phenoxy group, a 1-naphthyloxy radical, a 2-naphthyloxy radical, 4-methylphenoxy radical, 4-methoxy phenoxy group, 4-chloro phenoxy group, a 6-methyl-2-naphthyloxy radical, etc. are mentioned.



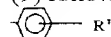
(5) Alkylene dioxane radicals, such as a methylene dioxy radical (6) アルコキシカルボニル基 (-C-O-R⁶) ;

R6 expresses the alkyl group which (2) defined. Specifically, a methoxycarbonyl group, an ethoxycarbonyl radical, etc. are mentioned.

(7) Cyano group (-CN)

(8) Nitro group (-NO2)

(9) following phenyl ** -- [Formula 4]



R7 expresses the substituent which a hydrogen atom or (1) - (8) defined. For example, phenyl group, tolyl group, methoxyphenyl radical, benzyl phenyl group, chlorophenyl radical, 3, and 4-methylenedioxyphenyl radical etc. is mentioned.

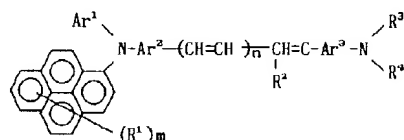
Ring type aromatic series radical; (10) As a ring type aromatic series radical There is a thing of univalent (R^3 , R^4 , Ar^1) or a divalent radical (Ar^2 , Ar^3). As a univalent radical, for example, a phenyl group, a biphenyl radical, a terphenyl radical, a pentalenyl radical, An indenyl group, a naphthyl group, an azulenyl radical, a hepta-RENIRU radical, a BIFE elm nil radical, as-in DASENIRU radical, a fluorenyl group, s-in DASENIRU radical, an ASENAFUCHIRENIRU radical, A play adenyl radical, an ASENAFU thenyl radical, a phenalenyl radical, a phenan tolyl group, an anthryl radical, a fluoran thenyl radical, an ASEFENANTORIRENIRU radical, the ASEAN TORIRENIRU radical, a TORIFE elm nil radical, a pyrenyl radical, a chestnut SENIRU radical, the North America Free Trade Agreement SENIRU radical, etc. are mentioned. Moreover, as a divalent radical, the same ring type aromatic series radical as the above can be mentioned.

[0011] Hereafter, the example of the compound shown by the general formula (I) is shown.

[0012]

[Table -1 (1)]

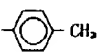







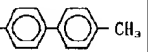
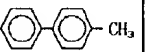
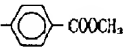



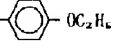
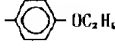




[Formula 1]



No.	Ar ¹	Ar ²	Ar ³	(R ¹) _m	R ²	n	R ³	R ⁴
1				H	H	0		
2	"	"	"	"	"	"		
3	"	"	"	"	"	"		
4	"	"	"	"	"	"		
5	"	"	"	"	"	"		
6	"	"	"	"	"	"		
7	"	"	"	"	"	"		
8	"	"	"	"	"	"		
9	"	"	"	"	"	"		
10	"	"	"	"	"	"		

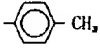




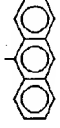
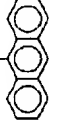






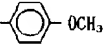
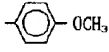



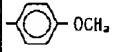
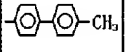
[0013]

[Table -1 (2)]

No.	Ar ¹	Ar ²	Ar ³	(R ¹) _m	R ²	n	R ³	R ⁴
11				H	H	O		
12	"	"	"	"	"	"		
13	"	"	"	"	"	"	-CH ₃	-CH ₃
14	"	"	"	"	"	"	-CH ₃	
15	"	"	"	"	"	"	-C ₂ H ₅	-C ₂ H ₅
16	"	"	"	"	"	"		
17	"	"	"	"	"	"		
18	"	"	"	"	"	"		
19	"	"	"	"	"	"		
20	"	"	"	"	"	"		
21	"	"	"	"	"	"		






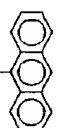
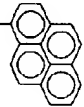









[0014]

[Table -1 (3)]

No.	Ar ¹	Ar ²	Ar ³	(R ⁴) _m	R ⁵	n	R ²	R ³
22				H	H	0		
23	"	"	"	"	"	"		
24	"	"	"	"	"	"		
25	"	"	"	"	"	1		
26	"	"	"	"	"	"		
27	"	"	"	"	"	"		
28		"	"	"	"	0		
29		"	"	"	"	"	"	"
30		"	"	"	"	"	"	"

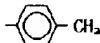






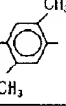






[0015]

[Table -1 (4)]

No.	Ar ¹	Ar ²	Ar ³	(R ¹) _m	R ²	n	R ³	R ⁴
31				H	H	0		
32		"	"	"	"	"	"	"
33		"	"	"	"	"	"	"
34	-CH ₃	"	"	"	"	"	"	"
35		"	"	"	"	"	"	"
36		"	"	"	"	"	"	"
37		"	"	"	"	"		
38		"	"	"	-CH ₃	"		
39	"	"	"	"		"	"	"

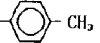


















[0016]

[Table -1 (5)]

No.	Ar ¹	Ar ²	Ar ³	(R ¹) _m	R ²	n	R ³	R ⁴
40				7-C(CH ₃) ₃	H	0		
41	"	"	"	3,6,8-tri CH ₃	"	"	"	"
42	"		"	H	"	"	"	"
43	"		"	"	"	"	"	"
44	"		"	"	"	"	"	"
45	"		"	"	-CN	"	"	"
46	"	"	"	"	-NO ₂	"	"	"
47	"	"	"	"	-COOCH ₃	"	"	"
48	"	"		"	H	"	"	"
49	"	"	"	"	"	"		
50	"	"	"	"	"	"		

[0017]

[Table -1 (6)]

No.	Ar ¹	Ar ²	Ar ³	(R ¹) _m	R ²	n	R ³	R ⁴
51				H	H	0		
52	"	"	"	"	"	"		
53	"	"	"	"	"	"		
54	"	"	"	"	"	"		
55	"	"	"	"	"	"		
56	"	"	"	"	"	"		
57	"	"	"	"	"	"		
								

[0018]

[Table -1 (7)]

No.	Ar ¹	Ar ²	Ar ³	(R ¹) _m	R ²	n	R ³	R ⁴
63				H	H	0		
64	"	"	"	"	"	"		
65	"	"	"	"	"	"		
66	"	"	"	"	"	"		
67	"	"	"	"	"	"		
68	"	"	"	"	"	"		
69	"	"	"	"	"	"		
70	"	"	"	"	"	"		
71	"	"	"	"	"	"		
72	"	"	"	"	"	1		
73	"	"	"	"	"	"		
74	"	"	"	"	"	"		





























[0019]

[Table -1 (8)]

No.	Ar ¹	Ar ²	Ar ³	(R ¹) _m	R ²	n	R ³	R ⁴
75				H	H	0		
76		"	"	"	"	"	"	"
77		"	"	"	"	"	"	"
78		"	"	"	"	"	"	"

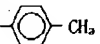



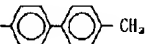
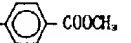

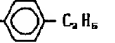
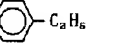
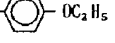
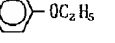
















[0020]

[Table -1 (9)]

No.	Ar ¹	Ar ^a	Ar ^a	(R ¹) _m	R ²	n	R ³	R ⁴
87				H	H	0		
88	"	"	"	"	"	"		
89	"	"	"	"	"	"		
90	"	"	"	"	"	"		
91	"	"	"	"	"	"		
92	"	"	"	"	"	"		
93	"	"	"	"	"	"		
94	"	"	"	"	"	"		
95	"	"	"	"	"	"		
96	"	"	"	"	"	"		
97	"	"	"	"	"	"		
98	"	"	"	"	"	"		
99	"	"	"	"	"	"	-CH ₃	-CH ₃
100	"	"	"	"	"	"	-CH ₃	




















[0021]

[Table -1 (10)]

No.	Ar ¹	Ar ²	Ar ³	(R ¹) _m	R ²	n	R ³	R ⁴
102				H	H	0		
103	"	"	"	"	"	"		
104	"	"	"	"	"	"		
105	"	"	"	"	"	"		
106	"	"	"	"	"	"		
107	"	"	"	"	"	"		
108	"	"	"	"	"	"		
109	"	"	"	"	"	"		
110	"	"	"	"	"	"		
111	"	"	"	"	"	1		
112	"	"	"	"	"	"		
113	"	"	"	"	"	"		

[0022]

[Table -1 (11)]

No.	Ar ¹	Ar ²	Ar ³	(R ¹) _m	R ²	n	R ³	R ⁴
114				H	H	O		
115		"	"	"	"	"	"	"
116		"	"	"	"	"	"	"
117		"	"	"	"	"	"	"
118		"	"	"	"	"	"	"
119		"	"	"	"	"	"	"
120	-Cl ₃	"	"	"	"	"	"	"
121		"	"	"	"	"	"	"
122		"	"	"	"	"	"	"
123		"	"	"	"	"		
124		"	"	"	-CH ₃	"		
125	"	"	"	"		"	"	"

[0023] although the sensitization layer 2 '2' and 2 --' [", 2'''] or 2 --''' is made to contain one sort of the olefin compound which has the above pyrenyl radicals, or two sorts or more, the photo conductor of this invention can be used as the method of application of an olefin compound of having these pyrenyl radical showed to drawing 1 , drawing 2 , drawing 3 , drawing 4 , or drawing 5 .

[0024] The sensitization layer 2 which consists of the olefin compound, sensitization color, and binder (binding resin) with which the photo conductor in drawing 1 has a pyrenyl radical on the conductive base material 1 is formed. The olefin compound which has a pyrenyl radical here acts as photoconductivity material, and generation and migration of a charge carrier required for optical attenuation are performed through the olefin compound which has a pyrenyl radical. However, since the olefin compound which has a pyrenyl radical hardly has absorption in the visible region of light, it needs to add and carry out sensitization of the sensitization color which has absorption to a visible region by the light for the purpose which forms an image.

[0025] Sensitization layer 2' which the photo conductor in drawing 2 made distribute a pyrenyl radical on the conductive base material 1 in charge conveyance data medium 4 which consists of an olefin compound which it has, and a binder is prepared in the charge generating material 3. The olefin compound which has a pyrenyl radical here forms charge conveyance data medium with a binder (or a binder and a plasticizer), and, on the other hand, the charge generating material 3 (inorganic or charge generating material like an organic pigment) generates a charge carrier. In this case, charge conveyance data medium 4 accepts the charge carrier which the charge generating material 3 mainly generates, and is taking charge of the operation which conveys this. And if it is in this photo conductor, it is fundamental conditions that an absorption wavelength field does not lap [charge generating material and the olefin compound which has a pyrenyl radical] mainly in a visible region mutually. This is because it is necessary to make light penetrate to the charge generating material surface in order to make the charge generating material 3 generate a charge carrier efficiently. When it combines with the charge generating material 3 which the olefin compound which has the pyrenyl radical expressed with a general formula (I) does not almost have absorption in a visible region, generally absorbs the light of a visible region, and generates a charge carrier, it is the features to work as charge conveyance material effectively especially.

[0026] Sensitization layer 2'' which consists of a laminating with the charge conveyance layer 4 containing the olefin compound with which the photo conductor in drawing 3 has the charge generating layer 5 which makes charge generating material 3 a subject on the conductive base material 1, and a pyrenyl radical is prepared. In this photo conductor, by the light which penetrated

the charge conveyance layer 4 reaching the charge generating layer 5, and generating of a charge carrier taking place in that field, the charge conveyance layer 4 wins popularity in impregnation of a charge carrier, that conveyance is carried out, and, on the other hand, generating of a charge carrier required for optical attenuation is performed by the charge generating material 3, and conveyance of a charge carrier is performed by the charge conveyance layer 4 (the olefin compound which mainly has a pyrenyl radical works). Such a device is the same as that of the explanation given in the photo conductor shown in drawing 2.

[0027] The photo conductor in drawing 4 makes reverse the order of a laminating of the 3rd charge generating layer 5 and the charge conveyance layer 4 containing the olefin compound which has a pyrenyl radical, and generating of the charge carrier and the device of conveyance are made like the above-mentioned explanation. In this case, in consideration of a mechanical strength, a protective layer 6 can also be formed on the charge generating layer 5 like drawing 5.

[0028] What is necessary is to dissolve one sort of the olefin compound which has a pyrenyl radical, or two sorts or more in the solution which melted the binder, to build the liquid which added the sensitization color to this further, to apply this on the conductive base material 1, to dry, and just to form the sensitization layer 2, if it is the photo conductor shown in drawing 1 in order to actually produce this invention photo conductor.

[0029] 3-50-micrometer 5-20 micrometers are preferably suitable for the thickness of a sensitization layer. The amount of the olefin compound which has the pyrenyl radical occupied in the sensitization layer 2 is about 50 % of the weight preferably 30 to 70% of the weight, and the amount of the sensitization color occupied in the sensitization layer 2 is 0.5 - 3 % of the weight preferably 0.1 to 5% of the weight. As a sensitization color, the brilliant green, Victoria blue B, Methyl Violet, A crystal violet, a thoria reel methane color like acid violet 6B, Rhodamine B, rhodamine 6G, rhodamine G extra, Eosine S Erythrosine, a rose bengal, xanthene dye like a fluorescein, Thiazine dye like a methylene blue, cyanine dye like cyanine, Pyrylium colors, such as 2, 6-diphenyl-4-(N and N-dimethylamino phenyl) thia pyrylium perchlorate, and benzo pyrylium salt (it indicates to JP,48-25658,B), etc. are mentioned. In addition, even if these sensitization colors are used independently, two or more sorts may be used together.

[0030] Moreover, what is necessary is to make the solution which dissolved the olefin compound which has one sort or two sorts or more of pyrenyl radicals, and the binder distribute the particle of the charge generating material 3, to apply this on the conductive base material 1, to dry, and just to form sensitization layer 2', in order to produce the photo conductor shown in drawing 2.

[0031] 3-50-micrometer 5-20 micrometers are preferably suitable for the thickness of sensitization layer 2'. The amount of the olefin compound which has the pyrenyl radical occupied to sensitization layer 2' is 30 - 90 % of the weight preferably ten to 95% of the weight, and the amount of the charge generating material 3 occupied to sensitization layer 2' is 1 - 20 % of the weight preferably 0.1 to 50% of the weight. As charge generating material 3, for example A selenium and selenium-tellurium, a cadmium sulfide, As inorganic pigments, such as a cadmium-sulfide-selenium and alpha-silicon, and an organic pigment, for example, C.I. pigment blue 25 (Color Index CI 21180), The C eye pigment red 41 (CI 21200), C.I. acid red 52 (CI 45100), The C eye BASIC red 3 (CI45210), the azo pigment which has a carbazole frame (it indicates to JP,53-95033,A), The azo pigment which has a JISUCHIRIRU benzene frame (JP,53-133445,A), The azo pigment which has a triphenylamine frame (it indicates to JP,53-132347,A), The azo pigment which has a dibenzo thiophene frame (it indicates to JP,54-21728,A), The azo pigment which has an OKISA diazole frame (it indicates to JP,54-12742,A), full -- me -- non -- the azo pigment (it indicates to JP,54-22834,A) which has a frame -- The azo pigment which has a bis-stilbene frame (it indicates to JP,54-17733,A), The azo pigment which has a JISUCHIRIRUOKISA diazole frame (it indicates to JP,54-2129,A), Azo pigments, such as an azo pigment (it indicates to JP,54-14967,A) which has a JISUCHIRIRU carbazole frame, For example, phthalocyanine system pigments, such as C.I. pigment blue 16 (CI 74100), for example, indigo system pigments, such as C eye BATTOBURAUN 5 (CI 73410) and C.I. vat dye (CI 73030), and Argo -- a scaw -- perylene system pigments, such as Let B (Bayer make) and indanthrene Scarlett R (Bayer make), etc. are mentioned. In addition, even if such charge generating material is used independently, two or more sorts may be used together.

[0032] or [furthermore, / that the photo conductor shown in drawing 3 carries out vacuum deposition of the charge generating material to one or more conductive base materials in order to produce] -- Or it carries out whether the dispersion liquid distributed in the suitable solvent which dissolved the binder for the particle 3 of charge generating material as occasion demands are applied, and it dries. Furthermore, what is necessary is to perform surface finish, thickness adjustment, etc., to form the charge generating layer 5, to apply the solution which dissolved the olefin compound which has one sort or two sorts or more of pyrenyl radicals, and the binder, to dry, and just to form the charge conveyance layer 4 on this, by methods, such as buffing, if required. In addition, the charge generating material used for formation of the charge generating layer 5 here is the same as having carried out in explanation of aforementioned sensitization layer 2'.

[0033] 5 micrometers or less of thickness of the charge generating layer 5 are 2 micrometers or less preferably, and 3-50-micrometer 5-20 micrometers are preferably suitable for the thickness of the charge conveyance layer 4. If the charge generating layer 5 is one of those of a type which distributed the particle 3 of charge generating layer material in the binder, the rate of occupying in the charge generating layer 5 of the particle 3 of charge generating material is about 50 - 90 % of the weight preferably ten to 95% of the weight. Moreover, the amount of the compound occupied in the charge conveyance layer 4 is 30 - 90 % of the weight preferably ten to 95% of the weight. In order to create the photo conductor shown in drawing 4, the solution which dissolved the olefin compound which has a pyrenyl radical, and the binder is applied on the conductive base material 1. What is necessary is to carry out spreading desiccation of the dispersion liquid distributed in the solvent which dissolved the binder for the particle of charge generating layer material as occasion demands by methods, such as spray coating, and just to form the charge generating layer 5 on this charge conveyance layer, after drying and forming the charge conveyance layer 4. The

quantitative ratio of a charge generating layer or a charge conveyance layer is the same as that of the contents explained by drawing 3. Thus, the photo conductor which shows the still more suitable resin solution on the charge generating layer 5 of the obtained photo conductor to drawing 5 by forming a protective layer 6 by methods, such as spray coating, can be created. The binder which carries out a postscript can be used as resin used here.

[0034] In addition, the plastic film which vapor-deposited metals, such as metal plates, such as aluminum, or a metallic foil, and aluminum, to the conductive base material 1 in these photo conductor manufactures [which], or the paper which performed electric conduction processing is used. Moreover, although condensation resin, such as a polyamide, polyurethane, polyester, an epoxy resin, the poly ketone, and a polycarbonate, a polyvinyl ketone, polystyrene, Polly N-vinylcarbazole, a vinyl polymerization object like polyacrylamide, etc. are used as a binder, all the resin that is insulation and has an adhesive property can be used. Although the plasticizer is added to the binder as occasion demands, as such a plasticizer, halogenation paraffin, polychlorinated biphenyl, dimethyl naphthalene, dibutyl phthalate, etc. can be illustrated.

[0035] Furthermore, a glue line or a barrier layer can be prepared in the photo conductor obtained as mentioned above between a conductive base material and a sensitization layer if needed. As a material used for these layers, it is a polyamide, a nitrocellulose, an aluminum oxide, etc., and 1 micrometer or less of thickness is desirable. In order to copy using the photo conductor of this invention, after giving electrification and exposure to a sensitization side, development is performed and it imprints to paper etc. as occasion demands. The photo conductor of this invention has the advantage which was [be / sensitivity is high and / sensitivity / rich in flexibility] excellent.

[0036]

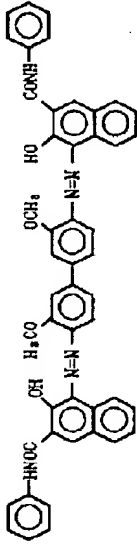
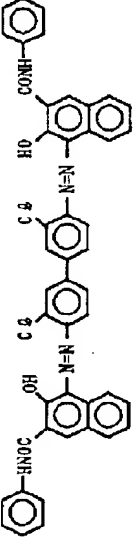
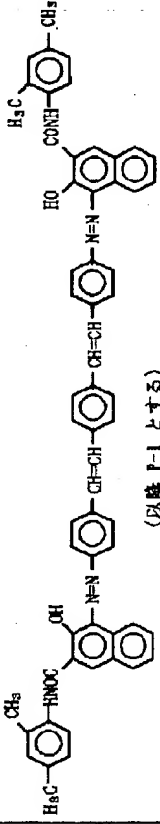
[Example] Hereafter, an example explains this invention. In addition, in the following example, all the sections are the weight sections.

[0037] [Example of composition of compound example No. (1)] N-(4-methylphenyl)-N-[4-(4-amino styryl) phenyl]-1-amino pyrene 3.00g (6.0mmol) was added to 3.32g (24.0mmol) of potassium carbonate, 0.76g (12.0 mols) of copper powder was added to iodobenzene 30ml, and 184 degrees C was agitated under nitrogen-gas-atmosphere mind for 14 hours. After adding filtration and chloroform with cerite and rinsing this reaction mixture in a separating funnel, the solvent was distilled off, silica gel column chromatography processing (toluene/cyclohexane: eluate; 1/3 vol) was carried out, and the obtained residue was obtained 3.23g (82.4% of yield) of purification objects. This was recrystallized in the cyclohexane and N-(4-methylphenyl)-N-[4-(4-diphenylamino styryl) phenyl]-1-amino pyrene 2.39g (61.0% of yield) of a yellow needle shape crystal was obtained. The melting point was as follows [value / 203.5 to 204.5 degree C, and / elemental-analysis] as C₄₉H₃₆N₂.

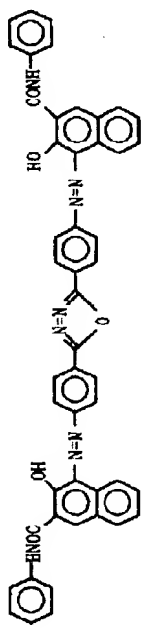
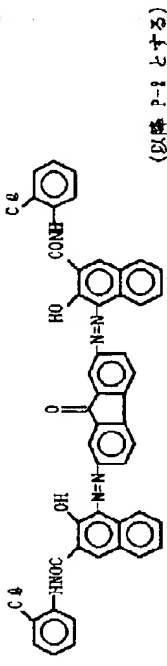
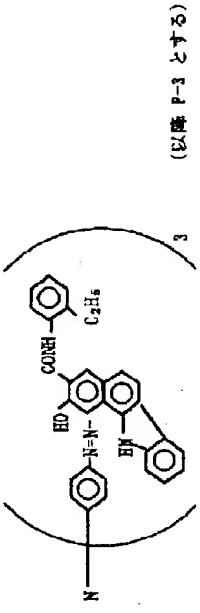
C % H % N % Actual measurement 90.26 5.42 4.25 Calculated value 90.15 5.56 4.29 [0038] On the aluminum side of the conductive base material which consists of a polyester base which carried out grinding mixing of the DAIAN blue (C.I. pigment blue 25, C.I.No.21180) 76 section, the 2% tetrahydrofuran solution of polyester resin [Made in [Oriental Rust-proofing] Byron 200] 1260 section, and the tetrahydrofuran 3700 section in the ball mill as example 1 charge generating material, and carried out the vacuum plating of aluminium of the obtained dispersion liquid, the doctor blade was used and it applied, and it air-dried and the charge generating layer with a thickness of 1 The olefin compound 2 section which, on the other hand, has the pyrenyl radical of compound example No. 1 as charge conveyance material, After carrying out mixed dissolution of the [panlight K1300 and Teijin Make] made of poly ABONETO resin 2 section, and the tetrahydrofuran 16 section and considering as a solution, On said charge generating layer, used the doctor blade and applied this, and subsequently dried for 5 minutes at 120 degrees C for 2 minutes by 80 degrees C, the charge conveyance layer with a thickness of about 20 micrometers was made to form, and photo conductor No. 1 was created.

[0039] Photo conductor No.2-178 were created completely like the example 1 except having replaced an example 2 - 178 charge generating material, and charge conveyance material (olefin compound which has a pyrenyl radical) with what was shown in a table 2.

[Table 2-(1)]

感光体No.	電荷発生物質	電荷輸送物質 (ビレニル基を有する オレフィン化合物等.)
1		1
2		1
3	 <p>(以降 P-1 とする)</p>	1

[Table 2-(2)]

4		1
5	 (以降 P-1 とする)	1
6	 (以降 P-3 とする)	1
7	β 型 銅 フ タ ロ シ ア ミ ン	

[Table 2-(3)]

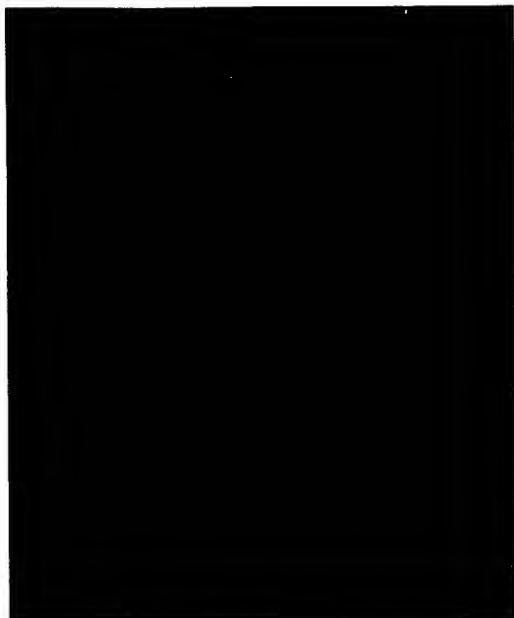
8	P-1	3
9	P-2	3
10	P-3	3
11	P-1	7
12	P-2	7
13	P-3	7
14	P-1	12
15	P-2	12
16	P-3	12
17	P-1	18
18	P-2	18
19	P-3	18

[Table 2-(4)]

20	P-1	25
21	P-2	25
22	P-3	25
23	P-1	26
24	P-2	26
25	P-3	26
26	P-1	28
27	P-2	28
28	P-3	28
29	P-1	29
30	P-2	29
31	P-3	29

[Table 2-(5)]

32	P-1	30
33	P-2	30
34	P-3	30



[Table 2-(6)]

4 4	P - 1	4 1
4 5	P - 2	4 1
4 6	P - 3	4 1
4 7	P - 1	4 2
4 8	P - 2	4 2
4 9	P - 3	4 2
5 0	P - 1	4 3
5 1	P - 2	4 3
5 2	P - 3	4 3
5 3	P - 1	4 4
5 4	P - 2	4 4
5 5	P - 3	4 4

[Table 2-(7)]

56	P-1	50
57	P-2	50
58	P-3	50
59	P-1	54
60	P-2	54
61	P-3	54
62	P-1	59
63	P-2	59
64	P-3	59
65	P-1	65
66	P-2	65
67	P-3	65

[Table 2-(8)]

68	P-1	72
69	P-2	72
70	P-3	72
71	P-1	73
72	P-2	73
73	P-3	73
74	P-1	75
75	P-2	75
76	P-3	75
77	P-1	77
78	P-2	77
79	P-3	77

[Table 2-(9)]

80	P-1	85
81	P-2	85
82	P-3	85
83	P-1	86
84	P-2	86
85	P-3	86
86	P-1	89
87	P-2	89
88	P-3	89
89	P-1	96
90	P-2	96
91	P-3	96

[Table 2-(10)]

92	P-1	98
93	P-2	98
94	P-3	98
95	P-1	99
96	P-2	99
97	P-3	99
98	P-1	100
99	P-2	100
100	P-3	100
101	P-1	101
102	P-2	101
103	P-3	101

[Table 2-(11)]

104	P-1	102
105	P-2	102
106	P-3	102
107	P-1	104
108	P-2	104
109	P-3	104
110	P-1	105
111	P-2	105
112	P-3	105
113	P-1	106
114	P-2	106
115	P-3	106

[Table 2-(12)]

116	P-1	107
117	P-2	107
118	P-3	107
119	P-1	108
120	P-2	108
121	P-3	108
122	P-1	111
123	P-2	111
124	P-3	111
125	P-1	112
126	P-2	112
127	P-3	112

[Table 2-(13)]

1 2 8	P-1	1 1 3
1 2 9	P-2	1 1 3
1 3 0	P-3	1 1 3
1 3 1	P-1	1 1 4
1 3 2	P-2	1 1 4
1 3 3	P-3	1 1 4
1 3 4	P-1	1 1 5
1 3 5	P-2	1 1 5
1 3 6	P-3	1 1 5
1 3 7	P-1	1 1 6
1 3 8	P-2	1 1 6
1 3 9	P-3	1 1 6

[Table 2-(14)]

1 4 0	P-1	1 2 0
1 4 1	P-2	1 2 0
1 4 2	P-3	1 2 0
1 4 3	P-1	1 2 4
1 4 4	P-2	1 2 4
1 4 5	P-3	1 2 4
1 4 6	P-1	1 2 5
1 4 7	P-2	1 2 5
1 4 8	P-3	1 2 5
1 4 9	P-1	2
1 5 0	P-2	2
1 5 1	P-3	2

[Table 2-(15)]

152	P-1	49
153	P-2	49
154	P-3	49
155	P-1	55
156	P-2	55
157	P-3	55
158	P-1	8
159	P-2	8
160	P-3	8
161	P-1	4
162	P-2	4
163	P-3	4

[Table 2-(16)]

164	P-1	5
165	P-2	5
166	P-3	5
167	P-1	87
168	P-2	87
169	P-3	87
170	P-1	92
171	P-2	92
172	P-3	92
173	P-1	48
174	P-2	48
175	P-3	48

[Table 2-(17)]

176	P-1	88
177	P-2	88
178	P-3	88

[0040] Vacuum deposition of the selenium was carried out to about 1 micrometer in thickness, and the charge generating layer was made to form on an aluminum plate with an example 179 thickness of about 300 micrometers. Subsequently, the olefin compound 2 section, the polyester resin (Du Pont polyester ADOHISHIBU 49000) 3 section, and the tetrahydrofuran 45 section which have the pyrenyl radical of No.1 are mixed. It dissolved and charge conveyance stratification liquid was built, after having used the doctor blade, applying this and air-drying it on the above-mentioned charge generating layer (selenium vacuum evaporation layer), dried under reduced pressure, the charge conveyance layer with a thickness of about 10 micrometers was made to form, and photo conductor No.179 of this invention were obtained.

[0041] It is a perylene system pigment [** 8] instead of example 180 selenium.

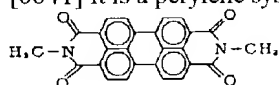


Photo conductor No.180 were created completely like the example 179 except having used olefin compound No.1 which forms a ***** charge generating layer (however, thickness about 0.6 micrometers), and has a pyrenyl radical as charge conveyance material.

[0042] The mixture which added the tetrahydrofuran 158 section to the example 181 DAIAN blue (it is the same as what was used in example 1) 1 section is ground in a ball mill. The olefin compound 12 section which has the pyrenyl radical of No.1 in this after mixing, The polyester resin (Du Pont polyester ADOHISHIBU 49000) 18 section is added. Used and applied the doctor blade on vacuum-plating-of-aluminium polyester film, dried the sensitization stratification liquid which furthermore mixed and was obtained for 30 minutes at 100 degrees C, the sensitization layer with a thickness of about 16 micrometers was made to form, and photo conductor No.181 of this invention were created.

[0043] On the polyester film substrate which carried out the example 182 vacuum plating of aluminium, blade coating of the charge conveyance layer coating liquid used in the example 1 was carried out like the example 1, subsequently it dried, and the charge conveyance layer with a thickness of about 20 micrometers was formed. The bis-azo pigment (P-2) 13.5 section, the polyvinyl-butryal (trade name: XYHL union carbide plastics company make) 5.4 section, THF After carrying out grinding mixing of the 680 sections and the ethylcellosolve 1020 section in a ball mill, the ethylcellosolve 1700 section was added, stirring mixing was carried out, and the coating liquid for charge generating layers was obtained. Spray coating of this coating liquid was carried out on the above-mentioned charge conveyance layer, it dried for 10 minutes at 100 degrees C, and the charge generating layer with a thickness of about 0.2 micrometers was formed. Furthermore, carried out spray coating of the methanol / the n-butanol solution of polyamide resin (trade name: CM-8000, Toray Industries make) on this charge generating layer, dried for 30 minutes at 120 degrees C, the protective layer with a thickness of about 0.5 micrometers was made to form, and photo conductor No.182 were created.

[0044] After the line made it corona discharge (-6kV or +6kV) charged for 20 seconds about photo conductor No.1-182 built in this way using a commercial electrostatography paper testing device (KK Kawaguchi electrical machinery factory SP428 mold), Leave it in a dark place for 20 seconds, and the surface potential V_{po} (bolt) at that time is measured. Subsequently, time amount (second) until it irradiates tungsten lamp light so that the illuminance on the surface of a photo conductor may become 4.5 luxs, and the surface potential is set to one half of $V_{po}(es)$ was found, and light exposure $E1/2$ (looks and second) were computed. The result is shown in a table 3.

[0045] Moreover, after making it each above photo conductor charged using a commercial electrophotography copying machine, performed the optical exposure through original drawing, the electrostatic latent image was made to form, and negatives were developed using the dry-developing agent, electrostatic image transfer of the obtained image (toner image) was usually carried out in the paper, and when established, the clear transfer picture was obtained. When an aqueous developer was used as a developer, the clear transfer picture was obtained similarly.

[Table 3-(1)]

感光体No.	V _{po} (ボルト)	E1/2(ルクス・秒)
1	-881	1.36
2	-862	1.19
3	-866	0.94
4	-873	1.87
5	-885	0.78
6	-639	0.44
7	-880	1.74
8	-899	0.95
9	-931	0.79
10	-701	0.45
11	-860	0.91
12	-871	0.77
13	-621	0.44
14	-881	0.95
15	-898	0.86
16	-645	0.51
17	-880	0.98
18	-897	0.84
19	-649	0.50
20	-852	0.99
21	-870	0.88
22	-631	0.51
23	-862	0.96
24	-873	0.80

[Table 3-(2)]

感光体No.	V _{po} (ボルト)	E1/2(ルクス・秒)
25	-632	0.46
26	-856	0.97
27	-881	0.83
28	-629	0.49
29	-847	0.93
30	-857	0.78
31	-625	0.45
32	-885	0.96
33	-901	0.80
34	-655	0.45
35	-895	0.94
36	-915	0.79
37	-651	0.44
38	-891	0.95
39	-909	0.79
40	-660	0.45
41	-890	0.96
42	-921	0.80
43	-663	0.45
44	-891	0.98
45	-914	0.84
46	-650	0.47
47	-1055	0.94
48	-1065	0.87

[Table 3-(3)]

感光体No.	V _{po} (ボルト)	E1/2(ルクス・秒)
49	-756	0.44
50	-1045	0.93
51	-1069	0.77
52	-750	0.44
53	-890	0.97
54	-903	0.83
55	-711	0.46
56	-1109	0.95
57	-1123	0.86
58	-780	0.43
59	-987	0.96
60	-1013	0.87
61	-713	0.44
62	-1063	0.92
63	-1085	0.82
64	-771	0.41
65	-1132	0.95
66	-1156	0.80
67	-800	0.42
68	-1113	0.91
69	-1160	0.84
70	-784	0.45
71	-1185	0.99
72	-1227	0.86

[Table 3-(4)]

感光体No.	V _{po} (ボルト)	E1/2(ルクス・秒)
73	-768	0.45
74	-1123	0.95
75	-1165	0.81
76	-757	0.44
77	-1186	0.98
78	-1263	0.85
79	-780	0.47
80	-1152	0.99
81	-1217	0.86
82	-753	0.48
83	-1197	0.99
84	-1235	0.87
85	-770	0.48
86	-1013	0.95
87	-1151	0.79
88	-723	0.45
89	-1037	0.93
90	-1076	0.78
91	-732	0.43
92	-1042	0.94
93	-1081	0.78
94	-736	0.43
95	-1057	0.95
96	-1072	0.80

[Table 3-(5)]

感光体No.	V _{po} (ボルト)	E1/2(ルクス・秒)
97	-740	0.45
98	-1023	0.95
99	-1053	0.79
100	-722	0.44
101	-1032	0.97
102	-1086	0.81
103	-721	0.46
104	-1043	0.95
105	-1065	0.79
106	-725	0.44
107	-1062	0.96
108	-1077	0.81
109	-741	0.45
110	-1003	0.93
111	-1043	0.78
112	-710	0.43
113	-1070	0.97
114	-1096	0.83
115	-756	0.46
116	-1082	0.98
117	-1090	0.84
118	-760	0.47
119	-1039	0.95
120	-1050	0.80

[Table 3-(6)]

感光体No.	V _{po} (ボルト)	E1/2(ルクス・秒)
121	-725	0.45
122	-1020	0.96
123	-1044	0.81
124	-716	0.45
125	-1009	0.97
126	-1037	0.80
127	-740	0.46
128	-987	0.91
129	-1013	0.77
130	-701	0.43
131	-1051	0.95
132	-1079	0.79
133	-742	0.46
134	-969	0.94
135	-1022	0.77
136	-707	0.44
137	-1081	0.97
138	-1090	0.80
139	-765	0.46
140	-1031	0.94
141	-1037	0.77
142	-716	0.45
143	-1011	0.95
144	-1041	0.79

[Table 3-(7)]

感光体No.	V _{po} (ボルト)	E1/2(ルクス・秒)
145	-738	0.44
146	-1060	0.94
147	-1081	0.80
148	-752	0.46
149	-598	0.68
150	-646	0.60
151	-359	0.30
152	-998	0.98
153	-1031	0.96
154	-1044	0.71
155	-1045	0.96
156	-1072	0.90
157	-1036	0.64
158	-799	0.83
159	-850	0.79
160	-550	0.43
161	-640	0.65
162	-675	0.62
163	-369	0.31
164	-681	0.63
165	-701	0.61
166	-353	0.31
167	-813	0.84
168	-845	0.79

http://www4.ipu.jp/ipo.go.jp/cgi-bin/naa_web.cgi

感光体No.	Vp o (ボルト)	E1/2(レックス・秒)
169	-570	0.44
170	-825	0.89
171	-863	0.81
172	-581	0.46
173	-1081	1.09
174	-1170	1.00
175	-960	0.61
176	-1093	1.15
177	-1208	1.04
178	-997	0.59
179	-969	1.88
180	-1023	2.67
181	+953	1.56
182	+897	0.83

[0046]

[Effect] Not to mention excelling in the sensitization property, the reinforcement to the impact of heat or a machine target is size, and, moreover, the photo conductor of this invention can be manufactured cheaply.

[Translation done.]